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ABSTRACT

This seminar paper investigates the relationship between technology and environment to determine the impact of technology on the individual's personal and physical environment. It deals with the consequences for individuals living in an environment shaped by modern technology. The main focus is that technology has acted as a leveling force--a destroyer of unique differences of regional diversities and national identities, and of environments that complement an individual's life-style. Modern technology has created environments with characteristics of mass production, mass distribution, and mass consumption. Illustrations of environments that have been altered by technology are cited. Using urbanity as its vehicle, technology has created an environment containing technological problems which man can barely control. It is man's responsibility to solve these problems in order to regain control over his environment. The use of technology has become a moral issue, involving values and choices of technological advance versus survival in changed environments. Although man has used technology to better his life, he has not controlled technology. Thus, man has become the victim of technology and his resultant environment. He must correct the problems it has created before his environment is destroyed. (ND)

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TECHNOLOGY AND ECOLOGY - TECHNOLOGY'S CROSSROADS

By

Eugene C. Bammel

An Occasional Paper

on

Man/Society/Technology

EDITORS: Paul W. DeVore
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Preface

This paper was presented as one in a series of seminars on Man, Society, and Technology, conducted by the program of Technology Education at West Virginia University during the 1973 summer session. Over fifty individuals, including faculty and students from the university as well as individuals associated with the university through other institutions and endeavors, participated in the seminars.

The seminars were dedicated to a better understanding of the modes of inquiry, basic assumptions, principles, and concepts used by members of various disciplines and professions as they pursue answers to questions concerning the nature of man and technology in relation to the problems and issues associated with ecology, work, theology, law, medicine, politics, education, and economics; and questions concerning values, technological assessment and forecasting.

One overwhelming conclusion was the realization that the complex issues and problems associated with technology are related directly to decisions which are functions of value systems. Values require examination and reassessment. The educated citizen of tomorrow can not be trained as a narrow specialist nor can the humanist remain technologically aloof or illiterate. Education for the future may mean a rebirth of the renaissance man and perhaps a reevaluation of the technologies and humanities and the creation of a new interdisciplinary effort called the "techmanities."

Professor Bammel addresses the issue of the impact of technology on both the personal and physical environment. He focuses on the "leveling" factor of technology, the "sameness" and cites by illustration the different kinds of human environments that have been altered by technology.

The issue of "Technology's Crossroads" is values, choices. The process may be to determine what is most "appropriate" for the fulfillment of human potential. Are there "appropriate technologies?"

Paul W. DeVore
John F. Stasny
Morgantown, WV
September, 1976

Technology's Crossroads

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"The entire evolutionary process shifted at the moment of Sputnik, from biology to technology". (McLuhan, Counterblast)

Robert Benchley remarked that all people could be divided into two groups: those who divided everybody into two groups, and those that didn't. Today there is a very convenient dichotomy: those who are sensitive to what technology is doing to the environment, and those who are insensitive. Thanks to such popular writers as Paul Ehrlich, Barry Commoner, and Rene DuBos, most people who read are alert to the problems of the environment. Time magazine, as well as Newsweek and Saturday Review, offer regular columns on the issues of science, conservation and the environment. The daily newspaper accounts the running battles between the Environmental Protection Agency and the automakers, the problems of Polyvinyl Chloride production, the dangers of aerosol sprays, of supersonic flight and its effect on the ozone layer in the stratosphere, and there is even a daily newspaper and TV comment on the breathability of the local air. In a word, it is difficult not to be aware of the effects of technology upon the environment.

At a slightly more sophistacted level than the popular press, there is an ongoing scholarly battle between proponents of the

idea that technology got us into this mess, and only technology can get us out (vide Buckminister Fuller, Hermann Kahn, Marshall McLuhan, Constantine Doxiadis, Lewis Mumford) and those who think that it is on the edge or beyond the edge of being too late for mankind to undo the damage of technology: (vide Robert L. Heilbroner, Dennis Meadows, Jay Forester, Joe S. Bain, Raymond Dasmann, etc.). In this book, the problems of technology and environment will be personalized. The point of view is philosophical-psychological-biological. The question is: what does technology do to the individual? This volume will be reflective, dealing with the consequences for individuals of living in an environment shaped by modern technology.

The underlying and repeated thesis of B.F. Skinner's work is that our environment makes us be what we are. Skinner emphasizes our educational environment, but the thesis is just as true when generalized to apply to the whole environment. If we live in an overpopulated and polluted environment, our functioning as human beings is bound to be impared; living in a pleasant and congenial environment ought to foster our functioning. Environment is a major factor making us be what we are. The opening chapters of Rene DuBos' book, A God Within, constitute a virtual prose poem in praise of the peculiar influences of different places. From our own experience we know that having a glass of Rhine Wine in a castle on the Rhine is a wholly

different experience from having a glass of imported Rhine Wine in your living room in North America. Even a chef flown in from France cannot duplicate for you the experience of French cuisine in a Marseille or Grenoble restaurant. A taco in Alta California does not replicate the taste of one in Baja. When I first enrolled in the University of Toronto, an American on the faculty there said to me: "You will think Canadians are Americans. But after a few months, you will realize you are in a foreign country, and that Canadians are North Americans, but not Americans as you know them". It took some time, but I gradually came to realize that the social, political and geographical environment of Canada had forged a character markedly different from their language siblings across the border. Valley people are different from mountain people, city people from country people, University people from business people, fisherman from farmers, astronauts from mariners. It is not the difference of occupation but the difference of environment that imparts their distinctive characters. Technology has acted as a great leveling force, a destroyer of unique differences, of area or regional diversities, even of national identities. The Canadian government funds the CBC so generously not because it seeks the culturally superior, which the CBC is, but because it wants to encourage Canadians to watch Canadian programs, and forget NBC, CBS, and ABC for a while. Lewis Mumford has

written:

> One of the best reasons for the conservation movement . . . is that it demonstrates the irrationality of allowing any single factor to dominate the rest of the environment. Our technology has overemphasized, in every sphere of life, the factor of power, of mass production and standardization; it seeks to decrease variety in order to promote quantity. Our aim rather should be to promote variety in order to curb this monotonous quantification. (Mumford, p. 176)

Technologies generalize or universalize production: you can buy the same hand calculator in Tokyo or Boston; what is disturbing about this is that you can also buy a "Big Mac" in either Tokyo or Boston. The distinctive seafoods of both areas are still available - but there is a powerful leveling - if not debilitating - effect exerted by any mass merchandiser. "Fast food" is an excellent example of the mixed blessings of our technology: the fast food services are only possible by a combination of the technologies of freezing, heating, merchandising and employing. Few would debate that the meal that is 'all day a-cooking' has much more taste; in the technological culture however, few will take the time to satisfy their nourishment needs in the most satisfying, and perhaps the most healthful, manner.

Marshall McLuhan, who has given us clever criticism of media as technologies, affirms that a new technology creates "a totally new human environment". (McLuhan, p. ix) Technologies do create new environments: I think of the Argentine campesino or gaucho carrying his transistor radio, which puts

him in touch with the commercial values of the city, the pace of its music, the standard speech patterns of its announcers. I think of stereo, rated as the number one most valuable possession by 84 percent of my students last year, which equalizes or levels or creates a common environment for nine million students across the United States. I think of TV, which glues 40 million Americans to watching selected spectacles of national achievement, or selected nonsense such as Medical Center or Dr. Welby. On any weekday afternoon, 10 percent of the population may be watching soap operas (Time, January 9, 1976). And I think of IBM computers, which operate the Ford assembly plant in Mill Valley California, the Chevrolet Vega plant in Lordstown Ohio, and the Renault Factory at Issy-les-Moulineauz outside of Paris. It is this same IBM equipment that the Russians wished to buy in order to operate their heavy machinery plant outside Moscow, but the State Department, fearing military usage, vetoed. Technology not only creates a new human environment, but produces a "global village", as McLuhan has told us.

It is technology that creates our environments for us, and the characteristic environment of modern technology is the city. Our technology features mass production, mass distribution, mass consumption. And this process is most easily carried on if people are concentrated in areas of relatively dense population.

This too is the creation of a new environment. For some 99 percent of his history, man has been a hunter, a dweller in lush savannahs and arboreal jungles. (New York City is frequently referred to as a jungle, and the word uses only its pejorative sense). We have only recently begun to question the effect of urbanization on a human being. I should like to cite three pilot studies of the effect of Natural Environments on Disturbed Urban Youths in the hope of suggesting some reflection on what urban environments do to all of us. The first study is my own and was conducted in the summer of 1971 in Laytonville, California. A group of delinquents charged with various minor offenses spent six weeks in a primitive environment in Northern California. Hiking, Nature Interpretation, Music, and Shelter Construction occupied their time six days a week. A weekly trip into neighboring small towns served as required minimum dosage of urban experience--they needed the "fix" of bright lights, pool tables, pin ball machines, a beer in a bar, a milkshake at McDonald's; but they always seemed eager to return to the back country. A couple were unable to get along without the stimulus of a week end in San Francisco, but they eagerly returned to the hot dusty trails of the wilderness. Everyone of these individuals has pursued a career successfully, much to the amazement of concerned social workers, and in my files I have various testimonial letters of how

crucial that summer experience was in "determining" the course of their lives. Rachael Kaplan, a psychologist at the University of Michigan, reports much the same results in her extensive studies of troubled urban youth who were given a summer of wilderness experience in the Upper Peninsula of Michigan. She said that: "The acquisition of skills and consequent self-esteem, the challenge and the exceeding of one's own expectations and the development of a new perspective on human existence--all seemed consequences of the outdoor camping experience". (Kaplan, Conference) She has run studies on contrast groups--urban youth for whom programs were scheduled and the generous help of counselors available, and her studies indicate that the youth who were selected for the outdoor camping group have had far less trouble with authorities, have fared better in school, and have had significantly superior occupational success. John Partington, of the Outdoor Learning Center of Carleton University, Ottawa has taken on delinquent youths and adults, and found the experience to have had far more beneficial results than any combination of detention and education. After four sessions in the Outdoor Learning Center, a man convicted of embezzlement wrote: "One feels oneself as the originator of his actions, instead of the pawn of teachers, repairmen, bankers, mothers, wives, etc.". (Partington, Conference)

The tension and pressure of urban existence affects us

all. My car stalled at a downtown intersection in a small town just as the light changed. I restarted immediately, but before I could move off I was the target of a tremendous amount of verbal abuse from the driver behind me, somewhat blotted out by the fact that he was also honking his horn. The sense of time urgency that plagues modern urban man has been studied by Staffan Linder in his book, The Harried Leisure Class. He points out that technology has produced an abundance of things for us, but has not produced for us more time in which to use them. As a result, we have garages filled with once-used tennis rackets, boats, golf clubs, hibachis, croquet sets, and a plethora of other seldom used consumer articles. Each mechanical appliance owned requires maintenance time--something buyers seldom consider--with the result that some of our free time is used up in repairing the items that save us time around the house or office.

In spite of his avowed reservations, Lewis Mumford remains the apologist of city existence. Realistically, given the ineluctable increase in global population, it is only urban existence that can accomodate such numbers. Constantine Doxiadis, who died at 62 in the summer of 1975, believed that an "ecumenopolis", a world city of 35 billion, was the desting of mankind. Paolo Soleri, with his "archology", wishes to build massive skyscraper communal apartments, and preserve the open countryside for

enjoyment and agriculture. The Back to the Land movements of the Whole Earth Catalogue and the Mother Earth News fill many more people with romantic dreams of escape than the numbers of those who actually return to the land. As a student of the agricultural communes of California, I can affirm, not without some sadness, that of all the fifty establishments in 1969, only four are still in existence. And out of all those countless thousands who departed the city in the 60's, few today have remained free of the urban environment, and fewer still are independent of modern technology. It is important to note that the Whole Earth Catalogue and the Mother Earth News are not anti-technology at all, but are gospels of applying new technology to old environments. Technology and urbanity are counterparts: even when technology is applied in the countryside, it works to make the farm or the small town more like the city in every way.

Etienne Gilson, the famous historian of medieval philosophy, looked at the middle ages and said: "A thousand years of abstract speculation"! But the historian Michelet rebutted him by saying: "A thousand years without a bath"! My wife and I moved into a farmhouse built in 1910. One of us had romantic ideas of leaving it for a year in its pristine condition. The same one of us has since consented to a dishwasher and been an ardent proponent of a bathtub and shower. And thus technology

conquers all!

> The final mission of the city is to further man's conscious participation in the cosmic and the historic process. Through its own complex and enduring structure, the city vastly augments man's ability to interpret these processes and take an active, formative part in them, so that every phase of the drama it stages shall have, to the highest degree possible, the illumination of consciousness, the stamp of purpose, the color of love. That magnification of all the dimensions of life, through emotional communion, rational communication, technological mastery, and above all, dramatic representation, has been the supreme office of the city in history. And it remains the chief reason for the city's continued existence. (Mumford p. 576)

Technology, using urbanity as its vehicle, has indeed created a whole new human environment. It is agrarian reform that has made the feeding of the world's millions possible, it is the pill that can be used to limit the birth rate, it is the dynamo that generates the power to run our lights, power our freezers, set off our alarm clocks, and perc our coffee. But it is also our technology that has blessed us with every conceivable pollution: Barry Commoner points out that the end of World War II signalled the beginning of the sharp rise in the production of pollutants: phosphate production increased 700 percent in 20 years, oxides of nitrogen 630 percent, tetraethyl lead 415 percent, mercury 2100 percent, synthetic pesticides 270 percent, inorganic nitrogen fertilizer 789 percent, nonreturnable beer bottles 595 percent. (Commoner, p. 125)

Technology alone cannot solve our technological problems. In fact, technological advance has in many areas reached the

arena of diminishing returns. E. J. Mishan, the British Economist and author of Technology and Growth, the Price we Pay, writes:

"For a moment, perhaps, modern man will dare to wonder whether it is really worth it; whether economic progress over the last couple of centuries has succeeded only in making life increasingly complex, frantic and wearing. The speed of travel grows from year to year, and from year to year more time is devoted in moving from one place to another. Physically, however, we are more idle and our lives more sedentary than our fathers'. We know the world's business from minute to minute, and practically nothing of the people who live in our neighbourhood. Far removed from the forces of nature, denizens of the new subtopia, we are degenerating into a breed of passenger-spectators whose first impulse on awakening it to reach for a switch". (Mishan, vii)

Mishan calls for a no-growth economy, and seeks a stabilization of technology. The point behind Mishan's book is that the use of technology is a question of values, that is, it is a philosophical issue, and until we can remove from our eyes the scales of seeing economics as the sole value, we have no chance of overcoming our technological nightmare. Applying our knowledge of growth and its limits to the food crisis, Lester R. Brown in his magnificent book By Bread Alone, proposes his solution to the problem of feeding the world's hungry in a strictly moral dimension:

"Our intent here is not to suggest that all affluent Americans, Russians, Europeans, or Japanese should abandon their automobiles or abstain from eating meat; it is to urge those who are more affluent to re-examine the link between their consumption of material goods and their own well-being. We need to ask whether a 20 percent increase in income indeed

brings a 20 percent increase in well-being, a 10 percent increase, or any increase at all. It has been said that there are two sources of unhappiness: not getting what we want, and getting it. Many of us may be in a situation where the only real satisfaction can come from trying to improve the lot of the world's most seriously deprived: those living in the Fourth World. Indeed, this could be the new moral and social frontier for mankind". (Brown, p. 251)

We might extend the remark Willy Brandt made to the U. N. General Assembly in the fall of 1973: "Morally it makes no difference whether a man is killed in war or is condemned to starve to death by the indifference of others". Morally, it makes no difference whether men are killed by the lack of technology or by the overabundance of technology. In America it is our hunger for power that is raping our environment and diminishing the quality of our lives. That same technological genius that invented snowmobiles to pollute the air with smoke and noise and run over the peaceful countryside could be applied to the machinery necessary to increase the crops of Asian rice paddies. That same technology that prepares Krispy Korn Kurls or Screaming Yellow Zonkers might be applied to methods of preserving foods in the sub Saharan African regions whose habitual cycle between feast and famine has suffered only famine the last several years. The use to be made of technology is not just a moral issue, but <u>the</u> moral issue on which the human race depends. It is in terms of technology that <u>eros</u>, the urge towards life, and <u>thanatos</u>, the urge towards death, engage in

their interminable struggle. It seems remarkable that Freud wrote the following passage, taken from Civilization and its Discontents, a full decade before the atomic bomb was dropped on Hiroshima:

> "The fateful question of the human species seems to me to be whether and to what extent the cultural process developed in it will succeed in mastering the derangements of communal life caused by the human instinct of aggression and self-destruction... Men have brought their powers of subduing the forces of nature to such a pitch that by using them they could now very easily exterminate one another to the last man. They know this-hence arises a great part of their current unrest, their dejection, their mood of apprehension. And now it may be expected that the other of the two "heavenly forces", eternal Eros, will put forth his strength so as to maintain himself alongside of his equally immortal adversary". (Freud, p. 143-144)

We have all heard and read enough statistics on the results of pollution of the environment. The cold facts need to be personalized as much as possible. We are all users of technology, and we are all polluters. We all suffer from the diminishment of the environment--do not ask for whom the bell tolls, the bell tolls for thee--and we are all users of the remaining fossil fuels this world has to offer. We are caught in the grips of technology; we are members of a technological culture, and our environment is every bit as much technology as it is the air we breathe and the forests we walk through. Paul Ehrlich is correct in affirming that we have come to the end of The Age of Affluence, but he is imprudent in sounding the warning to jump ship. For indeed, what waters shall we jump into? Joseph Wood Krutch is

to be admired for his phrase: "In Wilderness is the Salvation of Mankind", but that phrase must be balanced with the awareness that technology also has salvific capacities, and they must be put to use if wilderness is to be preserved, or if there are to be any human beings around to enjoy that wilderness.

At least since the time of Adam Smith, we have looked upon our environment as an exclusively economic entity. The by-laws of the state of Nevada still allow an individual to lay claim to vacant land, provided he can "exploit" it in some specified way. We have looked upon the world as a commodity to be exploited, and we have failed to see that the world is our home. The ancient Greek apologized to Mother Earth for digging furrows in her breast so that he might plant his seeds. The closest parallel we have to that in the modern world is the Buddhist shrine erected by the president of Toyota Motors in expiation to all those killed in traffic accidents each year. Sam Keen has a marvellous book called Apology for Wonder, and it is just this capacity for wonder, for awe, for astonishment, for aesthetic delight, that has been frozen by the industrial, consumptive, exploitative, technological era. Our capacity to philosophize, that is, to think for the sake of thinking, to reflect for the sake of reflecting, has been stilled. "For it is owing to their wonder that men both now begin and at first began to philosophize". (Aristotle, I Metaphysics) Culturally,

we are beginning to restore this dessicated sense of wonder, this dried up longing for beauty. The root of our technological malaise has been our own philosophical shortsightedness. Life is not for gain, for exploitation, for accumulation--many have tried, but no one has yet been successful in taking it with him - but life is for enjoyment, delight, ecstacy--being beside oneself with joy--and while technological developments may facilitate this, the humblest Greek peasant or the poorest Australian Aborigine may far excel the wealthiest North American with his abundance of technological accoutrements.

In closing, let me once more return to B.F. Skinner. Skinner affirms an environmental determinism, and I have suggested in this paper that technology is the environment, the distinctive environment, of modern man. Those who oppose Skinner do so on the grounds of the importance of genetics in human behavior, or on the grounds of the x-factor, man's free will. It is ultimately the individual who chooses how he will behave, and it is man who chooses how he will use, or if he will use, his technology. Technology, that which man has made by art and reason, is only part of his environment. Far more important to me than the machines I make use of are the people and the natural environment I encounter. And human beings have some capacity to choose what parts of their environment will influence them.

I have some choice over the machines I will use or not use, and I do have some choice in terms of those I will associate with or not associate with; I have some choice over my interior climate, and I can choose to live in California or West Virginia. Just as the state is man writ large, what will become of the global environment is largely a matter of what choices politicians make in the next few years. We have in many ways been the willing victims of our technology: we have wanted to increase our grain crop, and so covered the soil with nitrogen fertilizer until we have nitrited our water supply; we have so fulfilled the dream of Henry Ford of every man (and every woman) having his (or her) own automobile that the air we try to breathe can hardly make it down our windpipes; we can choose to destroy ourselves in our detritus, or we can use technology so as to make life livable and enjoyable for those who do participate in the banquet of life. My personal choices can determine my day-to-day environment; but, as Aristotle wrote, man is not a solitary, but a social and political animal, and unless there are social and political solutions to the choices we will make with respect to technology, technology will devour its background, and become the sole environment. It is too simplistic to say that technology is the environment of modern man, for man is that one animal with the capacity to choose what will compose his environment, and a limited freedom to select aspects of his environment to which he will relate. From his beginnings man has

been distinguished from the other animals by his tool-making ability; one might think that this capacity is his unique biological form of adaptation. It could also be the source of his own destruction: for he has already fashioned the tools which could effect his own extinction. The Man-Environment Game is played for exceedingly high stakes. The consummation devoutly to be wished is that homo in his capacity as sapiens, being prudent, will instruct successfully homo in his capacity as faber, technology-maker.

Let me conclude with an excerpt from the master of Taoism, Chuang-Tzu. I have altered the translation only once:

> In the days when natural instincts prevailed, men moved quietly and gazed steadily. At that time, there were no roads over mountains, nor boats, nor bridges over water. All things were produced, each for its own proper sphere. Birds and beasts multiplied; trees and shrubs grew up. The former might be led by the hand; you could climb up and peep into the raven's nest. For then man dwelt with birds and beasts, and all creation was one. There were no distinctions of good and bad men. Being all equally without knowledge, their virtue could not go astray. Being all equally without evil desires, they were in a state of natural integrity, the perfection of human existence.
>
> But when technologists appeared, tripping people over inventions and commodities, confusion and distress found its way into the world, and man lost his oneness with the animals and the trees and the mountains and the rivers.
>
> The endless varieties of things around us all spring from inaction. Therefore it has been said: "Heaven and earth do nothing, yet there is nothing which they do not accomplish! BUT AMONG MEN, WHO CAN ATTAIN TO INACTION?" (--from The Scriptures of Taoism, Chaung-Tzu, p. 348)

This is a time indeed for inaction - for the Chinese word means

not inactivity, but collaborating or co-working with things so that all flows smoothly. "Flowing with the Tao" means allowing oneself to be swept along by the appropriate streams, and not fighting it. The challenge of our culture is finding these streams, and, instead of damming them to provide technological power, learning to read them, to flow with the, to help nature perform her task unhindered.

Brown, Lester R. By Bread Alone. N.Y., Praeger, 1974.

Children, Nature and the Urban Environment. A Symposium-Fair sponsored by the U.S.F.S. and the Department of Human Kinetics, George Washington University, May 14, 15, 16, 1975.

Chuang-Tzu. The Scriptures of Taoism in the World's Great Scriptures. MacMillan, N.Y., 1961.

Commoner, Barry. The Closing Circle. Bantam, N.Y., 1972.

DuBos, Rene. A God Within. Scribner's, N.Y., 1972.

Ehrlich, Paul. The End of Affluence. Ballantine Books, N.Y., 1974.

Freud, Sigmund. Civilization and its Discontents. London, Hogarth Press, 1955.

Heilbronne, Robert L. An Inquiry Into the Human Prospect, Norton, N.Y., 1974.

Keen, Sam. Apology for Wonder. Westminster, Louisville, 1967.

Kohl, Herbert. The Age of Complexity. Mentor, N.Y., 1965.

Linder, Staffan. The Harried Leisure Class. Columbia University Press, N.Y., 1970.

McLuhan, Marshall. Counterblast. Harcourt, Brace and World, N.Y., 1969.

McLuhan, Marshall. Understanding Media. Signet, N.Y., 1964.

Mishan, E.J. Technology and Growth. Praeger, N.Y., 1970.

Mother Earth News. P.O. Box 70, Hendersonville, N.C. 28739

Mumford, Lewis. The City in History. Harcourt, Brace and World, N.Y., 1961.

Skinner, B.F. Beyond Freedom and Dignity. Knopf, N.Y., 1971

Whole Earth Catalogue. Stewart Brand, Random House, N.Y.